List of books and papers published by T. Eggelston. pp. 4. From the author.

Valedictory address to the Twenty-ninth Graduating Class of the Women's Medical College. Rachel L. Bodley, A.M., M.D. From the authoress.

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GENERAL NOTES.

BOTANY.[1]

A BOTANIST'S TRIP TO "THE AROOSTOOK."—I find by reading the NATURALIST, that all matters of botanical interest are welcomed by its editors, and full of the enthusiasm of all lovers of nature, I venture to send to its readers a brief account of my life last summer in Aroostook county, Maine. I went there for the purpose of gathering "wild flowers," hoping to add a few new species to the large number which I had already collected in various counties in the State. I arrived at Fort Fairfield July 6th, and to my delight found the banks of the Aroostook river abounding in work for my brush. I remained there six weeks, and enriched my portfolio with sketches of the following plants, viz: *Tofieldia glutinosa, Allium Schœnoprasum, Parnassia Caroliniana, Triglochin palustre, Castilleia pallida, Rosa blanda, Anemone Pennsylvanica, Campanula rotundifolia* var. *linifolia, Ascyrum stans, Tanacetum Huronense, Hedysarum boreale* and *Astragalus alpinus.* (The three latter are reported by Professor Goodale and Mr. C. G. Pringle.) From Fort Fairfield I went to Caribou and Presque Isle, still following the river. In these places I gathered *Oxytropis campestris* (also reported by G. L. G.), *Nabalus racemosus, Lobelia Kalmii, Polygala Senega,* besides many more plants with which the banks abound. And in a cold deep swamp at Caribou, which they call the "Bog on the Barren," I gathered large quantities of *Valeriana sylvatica, Galium trifidum* vars. *pusillum* and *tinctorium, Epilobium molle,* and a few specimens of *Microstylis monophyllos* and *M. ophioglossoides.* Orchids abound in these wet, inaccessible places, especially *Cypripedium spectabile, Habenaria dilatata* and *H. hyperborea.* I found the first named in such masses and so high that it hindered our progress considerably. In an equally cold bog at Presque Isle, I gathered *Ribes rubrum, Lonicera oblongifolia* and *Rhamnus alnifolius.* In "a fallow" at Caribou, occurred an abnormal form of *Viola canina* (Aug.); I gathered it because it was so late in the season and the blossoms were so pretty, not discovering at the time that they were spurless, but I have shown them to four botanists and they agree that they are *V. canina,* and are both spurless and beardless. In the same wild and fascinating place I found large numbers of the delicate fern named *Cystopteris bulbifera;* it was so woven into the underbrush that the longest specimens which I was able to procure in a perfect state are but two feet in length, but they grew much longer. It was warm and

[1] Edited by PROF. C. E. BESSEY, Ames, Iowa.

damp there, and nestled beneath them were plants of *Asarum Canadense.* The same morning I stood to my eyes (five feet) in masses of *Eupatorium ageratoides.* It is a coarse but very showy plant with large corymbs of white flowers. It is abundant in Northern Maine. I mention the height of this plant to give some idea of the rank growth of the "weeds" in this county, and I will state here that I saw *Verbascum Thapsus* ten feet high, also *Lactuca Canadensis.* Go and see! I will not tell my aster story here, but will wait till we visit the place where I found it. *Sedum Telephium* is a very troublesome weed in some parts of the county, whole acres of land being overrun with it, and I am told that it has been there as long as the oldest inhabitants can remember. The only new plant which I found in the Swedish colony was *Ribes lacustre.* In riding from Caribou to Van Buren, a distance of twenty-two miles, the monotony of the wearisome ride was relieved by clumps of *Chenopodium capitatum.* Burdened with its bright red, pulpy fruit, it had sprung up among the charred stumps like a thing of beauty, as it was. At Van Buren we struck the St. John river, but the same plants which I have enumerated above repeated themselves with a few additional ones. Pedicularis, n. sp.? grew three feet high on the bank of the river where the water trickled down its sides. Among other plants I gathered *Galeopsis ladanum* and *Solidago virga-aurea, S. thyrsoidea,* and *S. bicolor* var. *concolor.* I did not see the typical form in this latitude, which by no means proves that it is not found there. *Solidago squarrosa* is abundant everywhere, and grows so rank that its only beauty lies in its gay color. Now for my large story. I measured *Aster puniceus* six feet and a-half high (Gray allows six feet), and the stem seven-eighths of an inch in diameter; it stood in a deep, narrow, damp ravine, and many of the branches were three feet long. It looked like a huge bouquet of purple flowers. The ferns which attracted my attention particularly at this place, were *Botrychium Virginianum* and *B. lunarioides,* vars. *dissectum* and *obliquum; Adiantum pedatum* and *Struthiopteris Germanica. Halenia deflexa* abounds throughout the county. *Viburnum opulus* was so abundant with its scarlet berries, that it made the landscape gorgeous. In the ride of forty-five miles along the river to Fort Kent, we found nothing new. At Frenchville, where the St. John turns to the south (the highest latitude to be reached in Maine), we looked upon acres of the mammoth stalks of *Solidago squarrosa.* In the two and a-half months which I passed in the county, I noted 208 different plants, and added fifty new ones to my own list. I saw a man in the county who cursed our "high sounding names." Ambitious to possess foreign shade trees, he was indignant to find that *Pirus Americana* and *Ulmus Americana* mean simply "round wood" and "elm," with which his forests abound. It may be worthy of notice that I found *Gaylussacia dumosa* fifty miles from the sea coast.—*K. Furbish.*

OUR SPECIES OF CEDAR APPLES.—The curious growths on white cedar, red cedar and juniper, to which the name Cedar Apples has been given, have recently been carefully studied by Dr. Farlow. The results of his studies are published in the Memoirs of the Boston Society of Natural History, covering thirty-eight quarto pages, and accompanied by two plates.[1] This important contribution is the first of a series of papers upon the Uredineæ, which Dr. Farlow hopes to publish soon. The popular interest in these plants is sufficient reason for giving space here for a synopsis of the paper.

All the cedar apples are now considered to be species of the genus Gymnosporangium, belonging to the order Uredineæ, and nearly related to the rusts (Puccinia, Uromyces, Phragmidium, etc.), from which they differ mainly by having their teleutospores imbedded in a mass of jelly. The life history of all our species is involved in some obscurity, which the careful and prolonged observations and experiments of the learned author have not been able to dispel. Œrsted, De Bary and others have succeeded in showing that the European species of Gymnosporangium have the same relation to certain species of the old genus Rœstelia, as subsists between the teleutosporic stage (Puccinia) of the grain rust, and the cluster cup of the barberry (Æcidium). In other words, it has been shown that certain supposed species of Rœstelia are but the æcidia of certain species of Gymnosporangium. Now as we have several species of Rœstelia in the United States, it may be supposed that a similar relation exists between them and certain of our Gymnosporangia. The most careful experiments have failed to show any such connection, however.

Most cedar apples are perennial, and appear year after year upon the host. The teleutospores, which are mostly two-celled, sometimes several celled, develop in little clusters which expand into columnar or irregular masses (technically called the *sporiferous masses)* when wet, as after a rain. In this expanded state they are very conspicuous, and are often mistaken by the non-scientific for the flowers or the fruits of the trees upon which they grow.

The following generic and specific descriptions are taken without modification from Dr. Farlow's paper; in his paper, however, each description is accompanied with notes upon their synonomy, and copious discussions upon structural peculiarities.

Gymnosporangium De Cand.

Spores yellow or orange-colored, usually two-celled, occasionally one to six-celled, on long hyaline pedicels, imbedded in a mass of jelly which, when moistened, swells into columnar or irregularly expanded masses. Mycelium parasitic in the leaves and branches of different Cupressineæ, producing in them various distortions.

[1] The Gymnosporangia, or Cedar Apples of the United States. By W. G. Farlow.

The genus as here defined includes the species of the old genus Podisoma.

1. *G. Ellisii* Farlow.—Sporiferous masses numerous, scattered, cylindrical, filiform, from one-eighth to a quarter of an inch high; spores dark yellow, linear-fusiform, obtuse, usually three to four-celled, sometimes one to five-celled, 10 to 16 μ. in diameter, 75 to 190 μ. long, average 120 to 150 μ.; pedicels long and slender; promycelia short and much curved, usually one from each cell. Mycelium perennial, distorting the smaller branches. On *Cupressus thyoides.* N. J., Mass.

2. *G. clavariæforme* De Cand.—Sporiferous masses numerous, scattered or aggregated, yellowish-brown when dry, bright yellow when swollen, cylindrical or slightly compressed, acute or occasionally forked at the apex, from a quarter to half an inch high; spores narrowly lanceolate, those on the outside of the gelatinous masses clavate, two-celled, 13 to 19 μ. broad, by 55 to 90 μ. long; promycelia usually one or two from each cell. Mycelium perennial, causing long fusiform swellings of the branches. On *Juniperus communis.* Maine.

3. *G. macropus* Lk.—Sporiferous masses aggregated in globose tufts, surrounded at the base by a ring formed by the raised epidermis and subepidermal tissue of the host plant, orange-yellow, cylindrical, acuminate, half an inch to an inch long, or at times longer; spores ovate-acute, two-celled, generally constricted at the septum, and with a papilla at the apex, 15 to 20 μ. broad, by 45 to 60 μ. long; promycelia generally four from each cell. Mycelium annual, producing globose or reniform knots in the smaller branches. On *Juniperus Virginiana.* Mass. to S. C. and westward to Wis., Mo. and Colorado.

4. *G. fuscum* De Cand.—Sporiferous masses numerous, generally approximated brownish when dry, dark-orange when swollen, a quarter to half an inch high, compressed-conical or wedge-shaped, upper margin thick, rounded, sometimes notched; spores roundish-ovate, two-celled, frequently constricted at the septum, 38 to 53 μ. long, by 15 to 22 μ. broad; upper cell either nearly hemispherical or obtuse; promycelia generally four from each cell. Mycelium perennial, causing long swellings of the branches. On *Juniperus Virginiana* and *J. communis.* Mass., Md.

5. *G. fuscum* De Cand., var. *globosum* Farlow.—Sporiferous masses densely aggregated, dark-brown when dry, yellowish-orange when swollen, a quarter to half an inch high, compressed-conical or wedge-shaped; spores ovate, sub-acute, 38 to 45 μ. long, by 19 to 21 μ. broad; promycelia usually four. Mycelium perennial, forming globose swellings in the branches. On *Juniperus Virginiana.* Mass. to S. C.

6. *G. biseptatum* Ellis. — Sporiferous masses flattened and brownish when dry, becoming hemispherical or oval and rugose when swollen, and of a light-yellow color, about a quarter of an

inch high; spores linear-oblong, obtuse, two to six-celled, most frequently three or four-celled, 50 to 84 μ. long, by 15 to 20 μ. broad; promycelia one or two from each cell. Mycelium perennial, forming node-like swellings in the branches. On *Cupressus thyoides.* Mass., N. J. On Libocedrus, Calif.

7. *G. clavipes* C. and P.—Sporiferous masses subpyriform or irregularly globose, becoming indefinitely expanded, reddish-yellow when dry, orange when swollen, about a quarter of an inch high; spores broadly ovate, obtuse, two-celled, generally constricted at the septum; pedicels broad, much swollen beneath the spores, 40 to 60 μ. long, by 22 to 38 μ. broad; promycelia usually two or three from a cell, frequently produced from the apex of the cells. Mycelium perennial in the leaves and branches, producing nest-like distortions. On *Juniperus Virginiana.* Mass., N. Y., N. J., Penn., N. C., S. C.

8. *G. conicum* De Cand.—Sporiferous masses subpyriform or indefinitely expanded, orange colored, half an inch high; spores oblong, two-celled, constricted at the septum, 48 to 58 μ. long, by 15 to 18 μ. broad; promycelia either two or four from each cell, given off near the septum. Mycelium perennial, forming long swellings in the branches. On *Juniperus Virginiana.* Mass., N. Y., S. C.

COHN'S CLASSIFICATION OF THE THALLOPHYTES.—This recent attempt at a satisfactory disposition of the Thallophytes deserves the careful study of botanists. As will be seen, Cohn still holds to the view originally put forth by him in 1872, which discards the old groups Algæ, Fungi and Lichenes. The present arrangement differs from his former attempt in several particulars, the most important of which is the disposition of the orders in two diverging series, the Carposporeæ and Gamosporeæ. Several things strike one as out of place. It is difficult to see, for example, any sufficient reason for placing the Schizosporeæ in the series Carposporeæ. The position of the Myxomycetes is also a curious one; it is only in a purely fanciful way that the plasmodium of the Myxomycetes can be regarded as a colony *(cœnobium)* similar to that of Volvox, Hydrodictyon, etc. The position assigned to the Ustilaginaceæ near Mucoraceæ is, to say the least, questionable. The Entomophthoræ are much more nearly related to the Saprolegniæ (if indeed they are not to be classed with them) than to Piptocephalis and Mucor.

SERIES I.—CARPOSPOREÆ.

This is nearly identical with the group of the same name as defined by Sachs in the fourth edition of his "Lehrbuch." It however includes the Schizosporeæ, and excludes the Characeæ, which are considered as low forms of Bryophyta.

ORDER 1. SCHIZOSPOREÆ: (*a*) *Schizophyta.* Families, Chroococcaceæ, Oscillariaceæ, Scytonemaceæ, Nostocaceæ, Rivulariaceæ. (*b*) *Schizomycetes.* Fam. Micrococcaceæ, Bacillaceæ, Cladotrichaceæ, Mycoñostaceæ.

ORDER 2. TETRADOSPOREÆ (Florideæ): Fam. Bangiaceæ, Dictyotaceæ, Nemaliaceæ, Lemaneaceæ, Ceramiaceæ, Gigartinaceæ, Sphærococcaceæ, Rhodomelaceæ.

ORDER 3. ASCOSPOREÆ: (*a*) *Gymnocarpi*, Saccharomyces, Ascomyces, Exoascus, Gymnoascus. (*b*) *Æcidiocarpi*, Fam. Uredineæ, Calyciaceæ. (*c*) *Discocarpi*, Fam. Stictideæ, Graphideæ, Hysteriaceæ, Bulgariaceæ, Lecideaceæ, Pezizaceæ, Collemaceæ, Parmeliaceæ, Usneaceæ. (*d*) *Porocarpi*, Fam. Laboulbeniaceæ, Sphæriaceæ, Lichenaeæ, Verrucariaceæ, Pertusariaceæ. (*e*) *Cleistocarpi*, Fam. Erysiphaceæ, Eurotiaceæ, Tuberaceæ.

ORDER 4. BASIDIOSPOREÆ: Fam. Auriculariaceæ, Tremellaceæ, Telephoraceæ, Clavariaceæ, Polyporaceæ, Agaricaceæ, Phallaceæ, Hymenogastraceæ, Lycoperdaceæ, Nidulariaceæ.

SERIES II.—GAMOSPOREÆ.

The single reproductive cells, formed by the sexual union of other cells, provide the main character binding together the groups of plants constituting this series.

ORDER 1. CONJUGATÆ: (*a*) *Zygophyceæ*, Fam. Bacillariaceæ, Desmidiaceæ, Zygnemaceæ. (*b*) *Zygomycetes*, Fam. Entomophthoraceæ, Ustilaginaceæ, Piptocephalideæ, Mucoraceæ.

ORDER 2. SIPHOIDEA: (*a*) *Siphophyceæ*, Fam. Caulerpaceæ, Bryopsideæ, Codiaceæ, Vaucheriaceæ. (*b*) *Siphomycetes*, Fam. Peronosporaceæ, Saprolegniaceæ, Chytridiaceæ.

ORDER 3. CŒNOBIÆ: (*a*) *Cœnophyceæ*, Fam. Protococcaceæ, Palmellaceæ, Valoniaceæ, Volvocaceæ, Hydrodictyaceæ. (*b*) *Cœnomycetes*, Fam. Myxomycetes.

ORDER 4. CONFERVOIDEÆ: (*a*) *Syngametæ*, Fam. Ulvaceæ, Ulotrichaceæ, Cladophoraceæ. (*b*) *Oosporeæ*, Fam. Sphæropleaceæ, Oedogoniaceæ, Coleochætaceæ.

ORDER 5. FUCOIDEÆ: (*a*) *Phæosporeæ*, Fam. Ectocarpeæ, Sphacelariaceæ, Chordariaceæ, Laminariaceæ, Sporochnoideæ. (*b*) *Oosporeæ*, Fam. Fucaceæ.

BOTANICAL NOTES.—The Secretary of the Linnean Society, B. D. Jackson, has recently been directing attention, in the *Journal of Botany*, to some recent tendencies in botanical nomenclature, and among others he deprecates the tendency, in some quarters, to the abandonment of the rather liberal use of initial capital letters in writing specific names, which Linnæus introduced. He regards the usage of Linnæus as authoritative, and cites examples to show that the initial capital letter should be used when the specific name is (1) an old generic name, (2) a native name, (3) a substantive used instead of an adjective, (4) a substantive used in the genitive case, (5) a substantive used adjectively in commemoration. "All other names," he says, "must begin with a small letter, even if derived from places or other genera." This certainly commends itself as conducive to *uniformity*, but were it not that at most it is a matter of but little importance, it might be asked whether even so great a master as Linnæus should be permitted to fix usage for all time.——In the same journal S. L. Moore dissents from Darwin's doctrine of the nature and meaning of cleistogamy, and believes "that cleistogamy is caused by the physiological condition of great fertility without crossing, coexisting with the morphological one of germination of the pollen while still within the anther-cell, or at least before expansion of the perianth. The result of the latter condition is arrest of the floral envelopes, which remain in position until separated or pushed up by the enlarging capsule." He bases this theory upon the well known fact that after fertilization the corolla soon withers. ——There is a widespread notion that it requires costly micro-

scopes and a good deal of apparatus to enable one to successfully engage in histological study in botany. The fallacy of this notion is well shown in an article in the April *Botanical Gazette*, by Dr. Rothrock, who describes the apparatus and modes of work in De Bary's laboratory in Strasburg. Hartnack's small upright microscope, without sub-stage or joint, and costing from thirty to forty dollars, are used. The optical parts are, however, of good quality, and furnish a power ranging up to about six hundred diameters. In making sections, razors and pieces of pith are mainly relied upon, expensive section cutters not being used.——Dulau & Co., of London, are to publish immediately an important book, "A Guide to the Literature of Botany," by B. D. Jackson. It includes nearly six thousand more titles than Pritzel's "Thesaurus."——"A Manual for the Preservation of the larger Fungi," by James L. English, is announced as in preparation.——M. C. Cooke has begun the publication of Illustrations of British Fungi, consisting of colored plates of the Hymenomycetes. The parts, issued quarterly, include sixteen octavo plates each.——Professor McBride, of the University of Iowa, has issued a Plant Record for the use of Students, which in some respects is an improvement upon any previously published ones.——J. F. James, in the *Journal of the Cincinnati Society of Natural History*, presents a paper in which he compares the flora of N. E. United States with that of Europe. It is an excellent summary of what is known as to the geographical distribution of plants.——Dr. Gray and Dr. Hooker have finally brought out their long promised report upon the vegetation of the Rocky Mountain region. It is published in Vol. VI of the Bulletins of the U. S. Geol. and Geog. Survey of the Territories. It will be noticed more fully hereafter.——Francis Wolle contributes another of his valuable notes on Fresh-water Algæ, to the April *Torrey Bulletin*.——An interesting list of the plants of Western Dakota and Eastern Montana, by Assistant Surgeon Havard, has just been issued from the Government printing office, as an appendix to the Report of the Chief of Engineers for 1880.

ZOÖLOGY.

MORE ABOUT THAT CAT.—In the February NATURALIST, I narrated some instances of unusual sagacity in our pet cat, "Old Shorty." He died on the 19th of that month, deeply lamented by his friends. He was not only a model of all the virtues consistent with the feline life, but possessed many high and noble traits not supposed to appertain to this species of carnivores. I mentioned his fastidiously neat and tidy habits, which he maintained down to the last day of his life. We once had a pet squirrel which was kept in a cage with the usual revolving wheel. "Shorty" never molested the mischievous rodent unless he happened to escape from the cage, when he was always ready to help